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Strategic Plan Development Guide

A Proposal by the

National Science and Technology Center's

Division of Science (ST-130)

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Purpose and Need

Recent developments within the Bureau of Land Management (BLM or Bureau) and with current and potential partners indicate that science and technology are at a major crossroads in the BLM. For example:

- In September 2000, the **BLM published its first Science Strategy**. The companion implementation plan is due for release relatively soon.
- Several **internal science teams and advisory bodies have been created** in the past decade at the request of the BLM Directorate.
- All of the **major federal land management agencies**, the US Geologic Survey (USGS), and some natural resource regulatory entities (e.g., EPA & USFWS) are talking about and forming **partnerships** to enhance communications and capabilities.
- The **academic world is involved** in the collection and analysis of federal lands information through a rapidly expanding Cooperative Ecological Studies Unit Program and site-specific General Agreements.
- Nonprofit environmental **organizations are creating huge natural resource databases** that cross jurisdictional boundaries.
- **Advances in technology and an ever-increasing body of science-based knowledge** are driving business systems, public awareness, and resource management decisions as never before.

Of course all of this is happening during an era of downsizing, "doing more with less," funding cuts, course adjustments every four electoral years, conflicting public values, and a BLM multiple-use mandate that is extremely complex and challenging.

Our challenge is to facilitate applications of science and technology in an increasingly complex, challenging work environment. To remain as effective as we were in the National Applied Resource Sciences Center (NARSC), we need to maintain an organization, mechanisms, and skilled senior professionals dedicated to customer service. To take advantage of the recent developments described above, we must also learn to think and work collaboratively, experiment purposefully to package technologies, and develop an opportunistic mind-set. We need to anticipate BLM needs and develop useful, inexpensive, and innovative applications to meet those needs. In sum, to be fully effective during these times we need to continue to provide traditional scarce skills, **and** become leaders in adaptive science and technology transfer. The question is how can we meet these needs within personnel and funding constraints?

This Guide will facilitate the creation of an NSTC Division of Science (ST-130) Strategic Plan responsive to these times and conditions. This Guide is intended primarily for internal use between November 2002 through March 2004.

Background Information

On October 1, 2000, the National Applied Resource Sciences Center (NARSC) was reorganized. The new organization became the National Science and Technology Center (NSTC).

> *The draft mission of the BLM National Science and Technology Center is to bring relevant science[1], **engineering, and technology** to managers and specialists in a form that can readily be used to solve management issues. (suggested modifications are bolded)*

The NSTC Division of Science (ST-130) was formed as a result of the reorganization.

General operating procedures and expectations for the NSTC are outlined in the NSTC "Decision Document" (April 2000). There is very limited information in the Decision Document to guide Division activities.

In December 2001, ST-130's new leadership team began a process of discovering, designing and defining our highest and best utility to the BLM. In February 2002, the entire Division met for 2.5 days to discuss who we are, what we have been doing, and where we should be going. As a result of these discussions, the ST-130 leadership team came up with the following working guideline:

> *Our role is to advance science and technology when the following conditions exist: the skills base is limited in the field, synthesis of information is logical (e.g., a regional perspective makes sense), and when centralized capability (a critical mass of expertise) focused on BLM issues and needs is likely to prove beneficial.*

What is Our Role in the BLM?

According to the Federal Land Policy and Management Act of 1976, as amended (FLPMA), **the mission of the BLM** is to manage the public lands

> *...so that they are utilized in the combination that will best meet the present and future needs of the American people.*

Credible science-based information is essential to the determination of which combinations of use by location will "best meet the present and future needs of the American people." FLPMA often refers to science and implies the need for scientific data to adequately implement the intent of the statute.

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[1] The 2000 BLM Science Strategy defines BLM's interpretation of "science" to include information that may be in the form of data, resource inventories, resource monitoring, or research results. Science and technology are often paired in the BLM lexicon. "Technology" as defined in Webster's College Dictionary as "the branch of knowledge that deals with applied science...." When the word "science" appears in isolation, technology can be inferred.

In the 2000 BLM Science Strategy, the BLM grapples with statutory and regulatory requirements relative to the use of science-based information in the resource management decision-making process:

> *"Science is useful for evaluating alternatives and estimating outcomes. However, it is not the sole factor in making decisions because the state of natural resource science is often insufficient to give definitive cause-effect predictions. Unknowns and uncertainties will always be associated with predictions of decision outcomes. Science may reduce but can never completely eliminate the uncertainty regarding future events. However,* ***the use of the best-available science—along with a consideration of political, social, and economic information—will result in the best-informed decisions.*** *(Emphasis added).*

In the concluding portion of the September 2000 BLM Science Strategy, NSTC is identified as a national body charged with "assisting national and regional teams" implementing the three major elements of the Strategy: 1) identifying the BLM's science needs, 2) communicating science needs and sharing results, and 3) providing science opportunities on the public lands. No specific direction is given as to how this assistance should be provided by the NSTC, nor NSTC's service constraints. The absence of specificity is noted in "Implementing the BLM Science Strategy and Advancing Science in the BLM; A Proposal" (BLM Science Coordination Committee, 2001), which states that "although the NSTC exists to serve BLM science and technology needs, there is no clear linkage to the other science units scattered across the agency, and the complete science role of NSTC has yet to be fully defined and accepted by all parts of the agency." To rectify the discontinuity, the BLM Science Committee recommends that the "NSTC serve as the primary unit to advance science in the BLM...."

We will assume that we have latitude to explore our role with our customers as NSTC's role (and by extension its Division of Science) has not been articulated in sufficient detail by the BLM Directorate. We hope that by engaging in the ST-130 Strategic Plan development process and its products, we will be able to provide new information to the BLM Directorate and insure that our role is understood by all BLM employees.

> Give me ambiguity or give me something else.
> *Anonymous*

National Science and Technology Center Mission Statement

On March 7, 2002, one week after the draft ST-130 mission statement was put together, Lee Barkow, the NSTC Director gave us a role and function statement for the NSTC:

> *The role and function of the NSTC is to support BLM offices by providing high quality products and services throughout our product lines and be recognized as the leaders in providing solutions to management and technical problems.*

His stated goal *"is that the NSTC be recognized as the preferred place for BLM to go to for products, services and expertise that we have."* (March 7, 2002)

Determine that the thing can and shall be done, and then we shall find the way. *Abraham Lincoln*

On October 1, 2000, BLM's NSTC was created to continue the science provider and technology transfer tradition that began at NARSC in 1995. The NSTC, however, has been given several new responsibilities that are revealed in the NSTC Director's role and function and goal statements above. In addition to continuing to provide "high quality" scarce resource "products and services" such as NARSC provided, we have an opportunity to do what it takes to become "**leaders** in providing solutions to management and technical problems." We also have to demonstrate for our customers that NSTC is the "**preferred place** for BLM to go to for products, services and expertise..." through proven relevant, superior, and timely performance.

Division of Science Draft Mission Statement

A mission statement clearly and simply defines what we do (our business) and why we do it (our purpose and vision of the future). In other words, a mission statement describes a work unit's role within a larger context. Every component part of an organization has its own mission, which in some way makes the overall mission of the organization achievable. If a part of the organization has a mission that is inconsistent with the organization's mission, the existence of that component is not justified.

While a clear Division of Science (ST-130) mission statement cannot, on its own, make ST-130 successful, a mission statement can be a powerful motivator, focusing the work of the people in the organization--magnifying their effectiveness. In the words of Covey (1989), a mission statement allows all staff to "begin with the [same] end in mind." In late February 2002 through June 2002, Division of Science staff reviewed guiding documents[2] and had several discussions to develop a draft ST-130 Mission Statement which was consistent with and supportive of the Bureau's mission:

> *The NSTC Division of Science advances science and technology in the BLM by providing scarce resources, synthesized knowledge, and centralized capability vital to the management of the Nation's resources.*

Our draft mission statement will be adjusted, if through BLM leadership and customer input in FY'03, if we discover the need.

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[2] Federal Land Policy and Management Act of 1976
"Building on Customer Needs; A Proposal for the Development of the National Applied Resource Sciences Center" (May 1995)
BLM National Applied Resource Sciences Center Mission Statement (April 1999)
Decision Document for the National Science and Technology Center (April 11, 2000)
"Bureau of Land Management Science Strategy" (September 2000)
"Issue Paper on Organization and Staffing Needs to Advance Science in BLM and Successfully Implement New BLM Science Strategy" Science Coordination Committee Review Draft. (June 15, 2002)
"Implementing the BLM Science Strategy and Advancing Science in the BLM" A Proposal. (July 2001)
NSTC "Director's Perspective" (in his own words – March 7, 2002)

The mission statements for ST-130 and NSTC are compatible and both provide helpful guidance in defining ***when*** our services are appropriate and ***what*** our expected accomplishments are relative to our customers needs. In sum, we are responsible for:

- determining, acquiring, and maintaining the resources and skills needed to support BLM natural resource managers;
- transferring synthesized scientific information for application to specific management or resource issues across a range of geographic scales;
- assessing the synthesized scientific information and providing insights into available data and technologies;
- identifying and testing emerging scientific concepts and technologies,
- applying and transferring scientific knowledge and skills; and
- identifying, developing, and supporting partnerships with organizations and institutions that can provide scientific services and expertise.

Draft Branch Mission and Responsibilities Statements

Each of the Division of Science Branches (see Appendix A for a table of organization) developed draft mission statements in the spring of 2002. A key requirement was that each Branch mission statement promote understanding of the unique characteristics of each Branch. Staff members explored what characteristics make each Branch special **and** identified opportunities for interactions with other branches.

Each Branch articulated "bottom line" responsibilities to illustrate work *being done* relative to the work that *needs to be done.*

Branch of Science Investigations (ST-131)

One of the most exciting changes brought about by the reorganization of NARSC to NSTC and the creation of the Division of Science is the formation of the Branch of Science Investigations whose proposed mission

> *...is to identify, investigate, analyze, and share opportunities for collaborative advancement of science in the BLM.*

The role and function of ST-131 is to investigate new opportunities for and facilitate creation of added value when and where science information and resources are requested by Bureau personnel. ST-131's position as a centralized and interdisciplinary team allows it to be familiar with many science related opportunities. ST-131 should bring an efficiency of effort to the synthesis, integration, and analysis of science-based information.

By being "forward-looking" and "big-picture oriented," it is hoped that ST-131 will help promote the synergistic use of science and technology in BLM strategic thinking, planning, and analysis. Keeping a pulse on trends, customer needs, and potential science partner capabilities, ST-131 will offer the BLM a better position to effectively and efficiently achieve BLM science goals over the near and longer term.

The Branch of Science Investigations was created to focus on advancing science in the BLM. Their job is to broker science—in other words, to find investment opportunities in terms of labor and funds. Also a forward-thinking team, this Branch is responsible for anticipating bureau-wide science needs and prototyping possible solutions for regional and national applications. For example, ST-131 directly supports the implementation of the BLM 2000 Science Strategy by facilitating the building, distribution, and use of each State's Science Catalog. ST-131 is also responsible for promoting and communicating the Bureau's science needs to external science providers--fostering and improving external relationships to address BLM's science needs.

A draft outline of a proposed Work Plan for FY'03 is located in Appendix B. As a new branch, ST-131 will facilitate consultation with customers, peers, and partners to develop strategies for priority tasks proposed in the ST-131 Work Plan. Tasks identified for full-scale scoping and potential strategic development include:

- facilitating grant and agreement instrument writing;
- finding sources of science support funds;
- creating a system to "pair BLM science needs" with those capable of meeting those needs;
- building upon proven tools such as the BLM Technical Reference Series and Resource Notes; and
- promoting sound science through colloquia, peer review, and the creation of robust, standardized information processing formats.

Branch of Science Applications (ST-132)

The Branch of Science Applications, ST-132, has been and remains the backbone of the Division of Science. This centralized group of specialists has typically provided highly technical and proven scarce skills in the physical and biological resource arenas. The draft mission of the Branch of Science Applications is to continue this tradition.

> *The draft mission of the Branch of Science Applications is to adopt, develop, and use scientific concepts and methods to address natural resource concerns.*

The role and function of ST-132 is to provide cost-effective expertise to the field and the Washington Office in the form of scarce-skills support, training, technology transfer, public education, modeling, and tools development. Demands on their time are consistently high.

The Branch transfers scientific methods and applications to BLM through training, publications, and demonstrations. Traditional programs, including soil, water, rangeland, forest and riparian management, have been the recipients of ST-132 expertise. Consulting and technical assistance provided to customers currently emphasize aquatic, riparian, and upland ecosystems. Because groundwater resources may interact with ecosystems, an additional area of expertise in hydrogeology is also available within this Branch. The technical skills currently represented in ST-132 are becoming even more scarce in Field Offices and are likely to remain scarce because Field Office operating budgets limit the number and kinds of specialists that can be hired to deal with many complex and controversial issues.

Branch of Environmental Compliance (ST-133)

The draft mission of the Branch of Environmental Compliance, ST-133, is to:

> *...enhance environmental quality through the application of environmental science and engineering, and compliance with environmental regulations.*

The Branch is a well-established group of specialists with a clear mandate to provide environmental science, engineering and regulatory expertise-in support of the BLM's efforts to: evaluate, cleanup and restore contaminated sites; implement the Comprehensive Environmental Response Compensation and Liability Act's (CERCLA) cost recovery and enforcement actions; protect air and water quality; and comply with environmental laws and regulations associated with these activities (primarily CERCLA, Resource Conservation and Recovery Act, Clean Water Act (CWA) and Clean Air Act (CAA)). In addition, the Branch provides programmatic support for the aforementioned regulatory activities in the form of assistance with guidance and policy development, training, technology transfer, contracting, and BLM representation on local, regional and national professional organizations.

The history of this group began in 1992 when the National Research Council evaluated the BLM Hazardous Materials Management Program and recommended that the BLM Service Center should be enhanced to provide the core of BLM's in-house technical expertise in hazardous materials management. The BLM Executive Leadership Team concurred with this recommendation and directed the Center to acquire the resources necessary to support BLM offices primarily with the evaluation and cleanup of contaminated sites. In 1993, the Center added resources and expertise to provide support in the areas of Natural Resource Damage Assessment (NRDA) and CERCLA cost recovery and enforcement based on recommendations from the BLM Washington Office and the Environmental Compliance Team. In 1993 and 1998 the Center added air and water quality expertise to assist BLM with CAA and CWA compliance issues. This expertise was added to the Center capabilities because of declining air and water quality expertise in BLM Field Offices. These resources were united within the Branch of Environmental Compliance with the reorganization of NSTC in 2000.

It is the responsibility of the Branch of Environmental Compliance to work closely with Washington Office staff to identify, acquire and maintain those centralized resources necessary to support the BLM in these areas. The Branch has identified four new support areas (listed in Appendix D) that will be strategically analyzed to verify need and develop alternatives to provided support. This analysis will be conducted in close coordination with BLM Washington, Field and State Offices, and the BLM Environmental Compliance Team.

Branch of Resource Systems and Remote Sensing/GIS Applications (ST-134)

Specialists in the Branch of Resource Systems and Remote Sensing/GIS Applications are responsible for 1) maintaining critical national natural resource database systems and 2) testing, prototyping, and applying technological tools for resource management use. Branch specialists possess unusual skills that they are expected to transfer to other BLM personnel through formal and informal training and consultation.

The draft mission of the Branch of Resource Systems and Remote Sensing/GIS Applications is to provide leadership and assistance in the development and use of advanced technological applications for resource management.

National Natural Resource Database Support

With an estimated 262 million acres of Public Lands to manage and countless resources, creation and use of electronic data management systems by the BLM is essential. The Branch supports user representatives of four major natural resource database systems:

1. Wild Horse and Burro Information System (HB);
2. Rangeland Administration System (RAS);
3. Timber Sales Information System (TSIS); and
4. Species Tracking System (STS).

The user representative's job is to serve full-time as a liaison between the field user and database development/management personnel in the Bureau. Each major natural resource database requires at least one full-time user representative. Other smaller resource databases (e.g., FORVIS) are supported as a collateral duty in other Branches within the Division of Science.

Create Technological Tools for Resource Managers

ST-134 specialists serve the BLM by critically evaluating technological developments, packaging specialized database products, and using technological tools in support of a variety of the Bureau's business operations. A majority of the BLM's business activities (an estimated 70% reported from the 2001 Bureau Enterprise Architecture study can be tied to locations on the ground. Advanced sensor technology and spatial data management tools are at the forefront of evolving technology, so a large portion of the Branch staff specializes in remote sensing and geographic information system technology.

While advanced technology skills are critical, equally important is the ability to recognize how advanced technology tools can be made to serve particular resource management activities. Many of the staff are experienced resource specialists (e.g., have backgrounds in fire, forestry, range, wildlife, resource planning and/ or wild horse and burro management). These resource specialists are responsible for sorting through advancements in technology and developing applications that meet the needs of BLM field personnel in many resource disciplines. They serve to integrate resource management and technology transfer.

Facilitate Advanced Technology Skills Development Bureauwide

The Branch of Resource Systems and Remote Sensing/GIS Applications works closely with the BLM National Training Center to develop training in support of the national natural resources databases and advanced technical tool applications. The specialists frequently serve as instructors in formal courses.

Prescription for a Strategic Plan

To be of maximum value to BLM managers, ST-130 needs to insure that the work it does is relevant and accessible now and in the future. ST-130 also needs to expand its capacity and services with little to no likelihood of an increase in personnel or funding. Good information is essential to expanding our capacity to do relevant work. Therefore, the strategic planning process proposed in this Guide is designed to provide critical information to verify the Division of Science's role in the BLM and to document current service relevance by functional area and future needs. The strategic planning process is straight-forward, though time-consuming:

1. Verify ST-130's role in the BLM & NSTC;
2. Document current service relevance by function;
3. Identify service gaps and future needs;
4. Investigate options to meet highest priority needs with little to no likelihood of an increase in personnel or funding;
5. Recommend action from the options researched; (The best action may be to send the customer to an alternative service provider.)
6. Evaluate and adjust work processes; and
7. Customize a performance based evaluation system.

With this information, the ST-130 leadership team will conduct workforce planning related activities, evaluate and adjust work processes, and customize a performance based evaluation system. Through accomplishment of these tasks, the first version of a dynamic Division of Science Strategic Plan should emerge in FY'04.

The ST-130 Strategic Plan will minimally contain information on the following topics:

Customer and partner expectations;
Division mission, role, and function relative to the BLM Science Strategy;
A vision of what we can (and plan to) become;
Guiding principles/sideboards to how we operate;
Individual Branch action plans;
Internal administrative and work accomplishment processes;
Group and individual performance expectations;
Plans to deal with barriers and obstacles; and
Effectiveness monitoring protocols.

Field and Washington Office customer needs data and direct input will be used to draft the Strategic Plan so that we can effectively meet current and future customer needs. We will also consult with existing and potential science and technology partners so that the Strategic Plan is practical where partner-dependency is critical.

Action plans will be developed for high priority tasks. Priorities will be determined through dialogue with our customers. Work assigned, performance expectations, and training needs will be articulated to enable ST-130 employees to adapt to new challenges, where necessary,

and to explore and reward accomplishments appropriately. A strategic plan in this context is considered a continuous improvement tool and as such is never final.

Have We Made the Right Assumptions About Our Role in the BLM?

ST-130 is starting this planning process with the following assumptions about its role and function as BLM science and technology providers.

1. ST-130's primary customers are the BLM Directorate, followed by BLM managers and resource specialists.
2. Defensible science-based natural resource management information is needed to support BLM decision-makers. ST-130 staff are expected to help provide this information.
3. The NSTC Division of Science has a significant role to play in the evolving BLM Science Strategy. That role will be clarified to a large extent in a BLM Science Strategy Implementation Plan when it becomes available.
4. State and Field Offices have significant capabilities to solve natural resource problems, however, sometimes they need outside assistance from science professionals and technical experts familiar with BLM issues, constraints, and culture.
5. A critical mass of BLM focused interdisciplinary specialists in a centralized location is an uncommon and valuable resource for BLM managers.

A critical first step is to verify and adjust these assumptions, if necessary. Verification will be accomplished by sharing these assumptions with the NSTC leadership team and the BLM Directorate, as appropriate.

What are ST-130's Customers' Needs and Expectations?

To determine customer needs and formalize an appropriate response (in the Strategic Plan) ST-130's leadership team proposes engaging ST-130 staff in the following needs assessment process:

1) Verify that currently provided services, tools and products by functional area are still relevant to the customer. If any current service, tool or product need is undocumented, determine actual need and document by function. Search databases containing science needs information, review BLM strategic plans, GPRA goals, Annual Work Plans, and search selected BLM staff files and personal notes containing info less than 5 years old. Conduct interviews with key customers, particularly program leads.
2) Objectively (create a database to determine the frequency of requests by function) prioritize needs and present to key customers in a report format for formal prioritization.
3) Predict future needs by preparing a summary report on service, tool and product gaps identified in steps 1 and 2. Interview program leads and internal and external science and technology providers to obtain opinions and trend data.

4) When needs are clearly understood and documented, analyze alternatives for meeting those needs by function and recommend an action alternative for management consideration.
5) Document approved actions, facilitate prioritization, workload assessments, and creation of measurable objectives. Assign work responsibilities, as appropriate.

The needs assessments proposed above could have a huge impact on current services provided by ST-130 personnel in FY'03-04. To limit the impact, needs assessments will generally be assigned to each subject matter expertise who has been providing high priority services in a functional area. This means that most staff in ST-132, ST-133, and ST-134 will have to perform only 1-3 needs assessments each. A standardized format will be developed to facilitate data collection and report preparation, but report customization based on discipline is expected.

Needs assessments, while useful, carry risk. Some customers may question the value of the services we provide. We may be told to do things differently or to discontinue doing work we do well or enjoy. We could expose sore spots. On the other hand, we could just as likely heal old wounds we may or may not have known about. We could also meet our goal of improved service and leadership! Risk is a necessary companion of success so we must accept it.

It is unlikely that all ST-130 services currently provided, and identified service gaps, can be addressed in FY'03 and early FY'04. Therefore, the ST-130 Strategic Plan will contain limited, but high priority information and action plans. Additional needs assessment work will be planned for in the Strategic Plan so that all needs are eventually evaluated and action recommendations formed. Needs assessments are likely to be iterative to monitor the effectiveness of on-going services. A needs assessment process will be fully articulated in the proposed Strategic Plan for unaddressed needs.

ST-130 is committed to assessing and documenting customer needs and expectations in a manner that minimizes impacts on the customers' time. As much information as can be found, therefore, will be obtained through analysis of the latest science and technology needs information available in the BLM Budget Planning System and BLM Science Catalogs. Customer needs will also be researched through a review of the data in the NSTC Projects Database, and pertinent internal and external documents and directives developed by teams, committees, and other bodies within and outside of the BLM. Customer science and technology needs expressed in casual conversations, formal interviews, and through email will be documented and tabulated by subject. Overall results will be provided to customers with an invitation for feedback.

Subjective assessments, such as the one proposed above, can result in useful information being generated quickly, at minimal expense and impact on the customer. Unfortunately, subjective assessments do not produce statistically defensible results. Bias, therefore, is a concern. By sharing results and commitment to a management review and approval process we hope to limit bias. Raw data and result analyses will be maintained by the Division of Science in expectation of a need to reexamine inputs.

If statistically valid results with high confidence values (the objective approach) are deemed essential, funds and management support for a customer needs questionnaire or survey will be necessary. The Government Accounting Office would have to approve the survey. A social sciences contractor would probably have to be hired to develop the survey and collect and summarize the results of the survey data. The subjective approach to the needs assessments would likely delay the development of the ST-130 Strategic Plan by at least one year—longer if funding is not available in the NSTC base.

How is this Strategic Plan Related to Workforce Planning?

Workforce planning[3] is a five-step process designed to help managers put the *right people* in the *right place* at the *right time*[4]. The process is being actively promoted by the Department of the Interior (DOI) through training materials as

- a way to manage demographics by actively preparing for skill loss due to large retirement-eligible populations;
- a method for understanding how to focus limited resources where they are most needed; and
- a way to ensure the continuity and long-term success of the Agency by actively engaging in managing skills replacement issues.

Employee participation is expected so that employees can "contribute energy and ideas for improving the operation." The process also gives employees an opportunity to understand work priorities, envision their role as future contributors, and consider future career opportunities.

One of the reasons the DOI is focusing on workforce planning is in response to predictions of significant loss of human resources through retirement in the next seven years. That concern is well represented in the Division of Science because the majority of the positions in the Division are senior specialists for the Bureau. Fifteen (15) percent of the Division of Science staff are currently eligible for retirement. One third of the staff will be eligible for retirement in three (3) years and nearly 90% will be eligible in 10 years. Several of the positions are so specialized they are the only subject matter expert in their field in the BLM. While everyone can be replaced, the institutional base of knowledge cannot. When an organization is composed of senior specialists their loss in large numbers is a significant concern.

Workforce planning tools and processes will be used to develop and annually update the ST-130 Strategic Plan. Steps 1-3 of the workforce planning process are briefly described in the text that follows. These three steps will be used to create basic information for the ST-130 Strategic Plan in FY'03 & '04. Step 4 in the workforce planning process (identification of current and future skill gaps and options for addressing them) should be accomplished in

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[3] Workforce Planning is defined as "The systematic assessment of future workforce needs and the determination of strategies and actions required to meet those needs." USDOI *Workforce Planning: 1-Day Overview for Managers and Supervisors.* 2002 Strategy Works, Inc

[4] From " Right People, Right Place, Right Time: A guide to Workforce Planning in the U.S. Department of the Interior"; http://www.doi.gov/hrm/WFPGuide.html. 35 pages

FY'04 & '05. Upon its completion, the ST-130 Strategic Plan will be modified to accommodate the results. Step 5 (monitor, evaluate, and revise) should occur in FYs'05-08.

Step 1. Analyze the Workload

A "workload analysis" in this context is defined as a "snapshot" of current affairs. While we have initiated the workload analysis process to create this Guide, a comprehensive workload analysis will be completed in FY'03 and used as baseline data for the ST-130 Strategic Plan. Peers in the BLM and in other land management agencies will be invited to facilitate these analyses.

Step 2. Identify Current Work and Program Efficiencies

> Opportunity is missed by most people because it is dressed in overalls and looks like work.
> *Thomas Edison*

Appendices B through E contain draft work plans for the four branches in the Division of Science. These draft plans were developed in an open forum and are the result of extensive internal dialogue. Collectively, these work plans can be viewed as a summary of our core skills and capabilities.

Through the customer needs assessment process described above, which includes review and feedback on these draft work plans, final work plans will be created. In the interim it is important that the draft work plans (appendices B-E) be viewed as a tool to facilitate customer input and not as contractual statements of work. It is also important to note that customer needs and management sideboards will be used to prioritize tasks in the work plans.

Step 3. Consider Future Budgets, Trends, Work Predictions, and BLM Strategic Plans

One can never know enough to say with any confidence what is going to happen. This makes Step 3 in workforce planning very difficult. Anticipating future BLM science and technology needs, however, is one of our new key responsibilities. In the Branches of Science Investigations (ST-131) and Resource Systems and Remote Sensing/GIS Applications (ST-134) this skill will be particularly important. With this new responsibility in mind, we will venture (with assistance) to craft some predictions in the Division of Science Strategic Plan. We will also look at worst-case scenarios so that we can minimize chaos and abort our plans if the unexpected happens. We will look at best-case scenarios by imagining who and what is possible so that we are prepared to take advantage of opportunities.

Management consultant William Bridges (1991), reminds us that it is inevitable that "today's winning technology and products [will become] obsolete sooner or later." To be prepared for this contingency he recommends life-cycle forecasting "on the organizational policies and structures that you are currently utilizing." He also recommends life-cycle planning for other elements of the work environment like employment levels, areas of technical expertise, management styles, supervisory training expectations, etc. We will perform life-cycle forecasting when we find the information and resources to do so.

Evaluate and Adjust Work Processes and Performance Expectations

The ST-130 Strategic Plan will identify work processes that we can control and how those processes will change to facilitate work. A more complete description of the impact of work processes we do not control may be developed and shared with those who have control.

Employee performance plans may be modified beginning in FY'04 to link performance expectations to the ST-130 Strategic Plan.

Staff Identified Barriers and Obstacles

All employees in the organization are critical in evaluating and correcting work processes. They have lived (often suffered) and have to continue working with whatever is developed. In February 2002, Division staff identified barriers and obstacles to work and initial actions needed from their perspective to resolve most of these:

- Overhaul the business system (e.g., project tracking and budget management) to make it more user friendly and valuable;
- Continue to identify obstacles and develop solutions in a taskgroup format;
- Through taskgroups figure out what we can do now about work obstacles and test corrective measures; e.g.:
  - Improve communications and distribution of information;
  - Commit to being leaders in science and technology—demonstrate our commitment;
  - Clarify SOPs;
  - Market our capabilities and value more effectively;
  - Complete and maintain a database inventory;
  - Create a project scoping Standard Operating Procedure;
  - Become technically elastic;
- Through taskgroups gather information to decide how to proceed when an obstacle is not understood well; e.g.,
  - Does the field have enough technical capability to carry on when we leave them on their own?
  - Should we use technicians more in some areas of our work?
  - What is the BLM Science Strategy and implementation plans?
  - What are the Federal Activities Inventory Reform (FAIR) Act and the NSTC position inventory? Figure out what is worth planning for and stop worrying about the rest.
  - What can the Project Review Board do for us?
  - What do we need to do to support real money for real science?
- Through taskgroups identify obstacles that need attention but may require mitigating measures beyond our control. (We will propose/support corrective measures as we have ideas to contribute). E.g.:
  - Improve and expand IT support capabilities;
  - Major science providers in Ft Collins are not being utilized well (we need to move to partner most effectively); and
  - "Get real money for real science."

> The winners of tomorrow will deal proactively with chaos, will look at the chaos per se as the source of market advantage, not as a problem to be got around. *Tom Peters, American writer*

Customer Identified Barriers and Obstacles

Additional barriers and obstacles not identified in the last section may be included in the Strategic Plan along with test solutions. As we develop an understanding of customer needs and expectations--and barriers and obstacles to these--we may develop new work processes to correct problems. These new work processes will be implemented as prescribed in interim instructions and/or in the final ST-130 Strategic Plan.

Division employees have volunteered to lead in the definition and resolution of these work barriers and obstacles. Employee needs and recommendations will be seriously considered. Appropriate work process adjustments will be adopted as Division protocol and documented in the Strategic Plan. Please note that since the Strategic Plan is dynamic and will be subject to annual review and update, work process protocols may change.

Performance-Based Personnel Management

The Division of Science Leadership Team is committed to implementing a performance-based evaluation and reward system for all staff, subject to constraints and provisions outlined in policy and regulations. The Division of Science Strategic Plan will describe what is meant by this commitment and how it will be accomplished. Examples of this commitment follow.

Performance Appraisals

Employee performance standards will be developed annually to support the NSTC, Division, and Branch missions. All employee performance appraisals should contain performance-based standards that are directly tied to work priorities identified in the ST-130 Strategic Plan in FY'04. Some performance-based standards will be applicable to all staff, while others will be relevant to only one or a few positions.

Training

Supervisors in the Division of Science share responsibility with employees for insuring that senior technical and professional staff skills are current and relevant to the BLM. There is some concern that, as we focus more on brokering science and technology transfer, individuals will lose important resource management application skills. There is also concern that the agency will have difficulty recruiting internal and external resources to replace senior specialists (15% are eligible for retirement now; 90% within 10 years). These concerns justify a strong focus on training. Support for training opportunities for senior staff and promising students will be given special attention in the proposed Strategic Plan.

Individual training needs will be discussed with each employee annually. Documentation of needs relative to employee performance standards will be recorded annually by supervisors on the "Individual Training Plan" (ITP) form. New and interested employees will be encouraged to develop Individual Development Plans (IDP), which are optional.

Recognition and Awards

The existing civil service recognition and awards program will continue to be used. Special recognition for individual and group accomplishments relative to advancing science and technology transfer in the BLM will be emphasized.

Strategic Plan Distribution

The BLM is uniquely situated as a major land management agency. The agency can address its science needs through Field and State staff specialists, through contractual agreements, and a national science and technology center. A critical mass of interdisciplinary science professionals and technical specialists committed full-time to serving the Bureau's science and technology transfer needs at all levels of the organization is a powerful resource. Ironically, many BLM staff including field managers, field resource specialists, and parallel professionals in other land management agencies are unaware of the NSTC and its dedication to the advancement of applied science and technology on Public Lands. Therefore,

> *One of our goals is that all BLM employees are aware of the services available to them through the BLM's National Science and Technology Center's Division of Science.*

The Strategic Plan Executive Summary will be shared with potential customers and partners to advertise our services and explain how we operate. While the NSTC has no lack of customers, we would like to insure that the Center's Division of Science fulfills its highest and best use as a national resource. Through the development and distribution of an Executive Summary of the NSTC's Division of Science Strategic Plan in FY'04, we hope to improve our utility and effectiveness Bureauwide. The Executive Summary will affirm who we serve, what we are capable of, where we are headed, and how we plan to partner internally and externally. Our role as science and technology service providers and partnership brokers for the BLM will be clarified.

Guide Approval

The NSTC Division of Science (ST-130) proposes to create a Strategic Plan by the middle of FY'04 to ensure that we maximize our value as a BLM science and technology resource unit. The proposed Strategic Plan is intended primarily for internal use as it will contain operational details of interest only to the NSTC leadership team and to staff in the Division of Science. An Executive Summary to this plan, however, will be developed and disseminated to a broader audience as described above.

The NSTC Director has ST-130 Strategic Plan Development Guide concept and general implementation approval authority. Many of the actions proposed in this Guide involve NSTC customer input. The content and distribution of certain products, and implementation of some proposed action elements resulting from Guide implementation require specific NSTC Director approval. For example:

- Requests for information and or assistance from BLM leadership team members; and
- Conclusions and final reports based on data collection and analysis efforts.

Management approval authority may be assumed through delegation of authority to the Division of Science Leadership Team for products and actions normally the responsibility of a supervisor and program manager (for example employee performance appraisals, development of and modifications to internal work instructions and processes, and management of employee workloads). Several of the changes called for in this Guide are already taking place because they fall within the management discretion of Division of Science Leadership Team members.

Some of the proposed actions in the Strategic Plan Development Guide could ultimately result in alteration of the ST-130 work environment. Employee union notification requirements, therefore, will be carried out as agreed to in applicable union contracts.

Conclusion

Effective management of "our Nation's public lands requires accurate scientific information" (Tom Fry, BLM Director, 2000). To best meet the "science" needs of BLM public land managers, the NSTC Division of Science (ST-130) plans to develop an organization and upgrade our customer response system so that we can meet evolving management needs, **and** anticipate and lead in the advancement of science and technology in a world of constant challenge (thus opportunity) and socioeconomic and environmental change.

ST-130 is committed to meeting the science needs of the Bureau. This Strategic Plan Development Guide is the product of retrospective and futuring work accomplished in FY'02 by ST-130 staff and is evidence of our desire to be relevant and increase our capacity to "help those who manage the land." To reinforce this sense of commitment we will conclude this guide with a promise. (A promise establishes a corporate value when it is made by an organization.) ST-130 as an organization promises during the strategic planning journey to:

1. Focus on being adaptable, responsive, dynamic, and relevant to "those who manage the land;"
2. Energetically serve our customers interests and needs first;
3. Prove our value to the BLM every day in a cost effective and timely manner;
4. Facilitate production of scientifically credible (defensible) results, and advise our customers on results and product limits; and
5. Create an ST-130 Strategic Plan in FY'04 using this Guide as a strategic planning framework.

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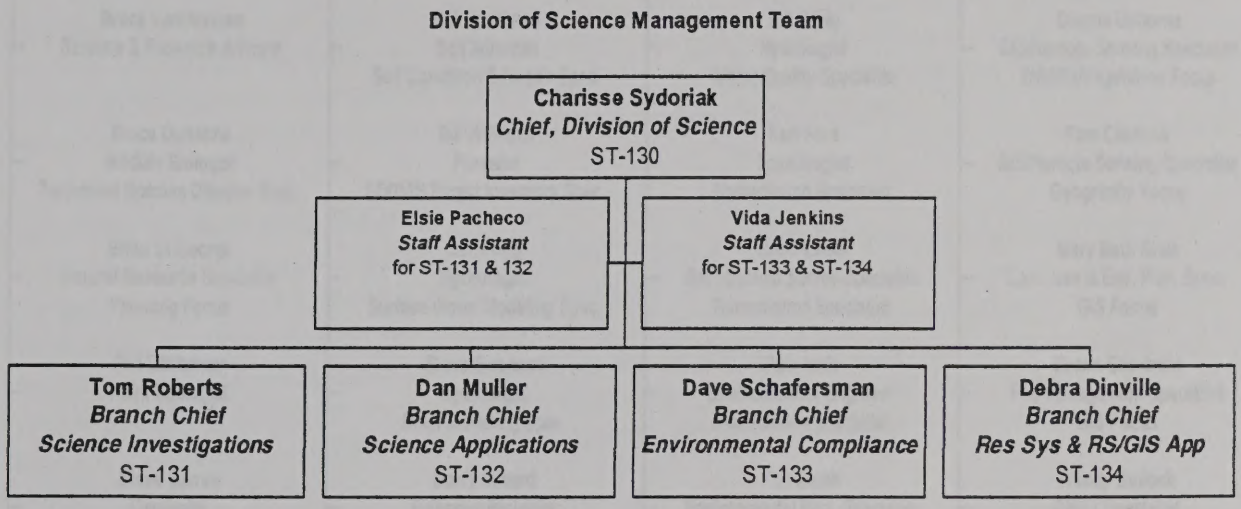
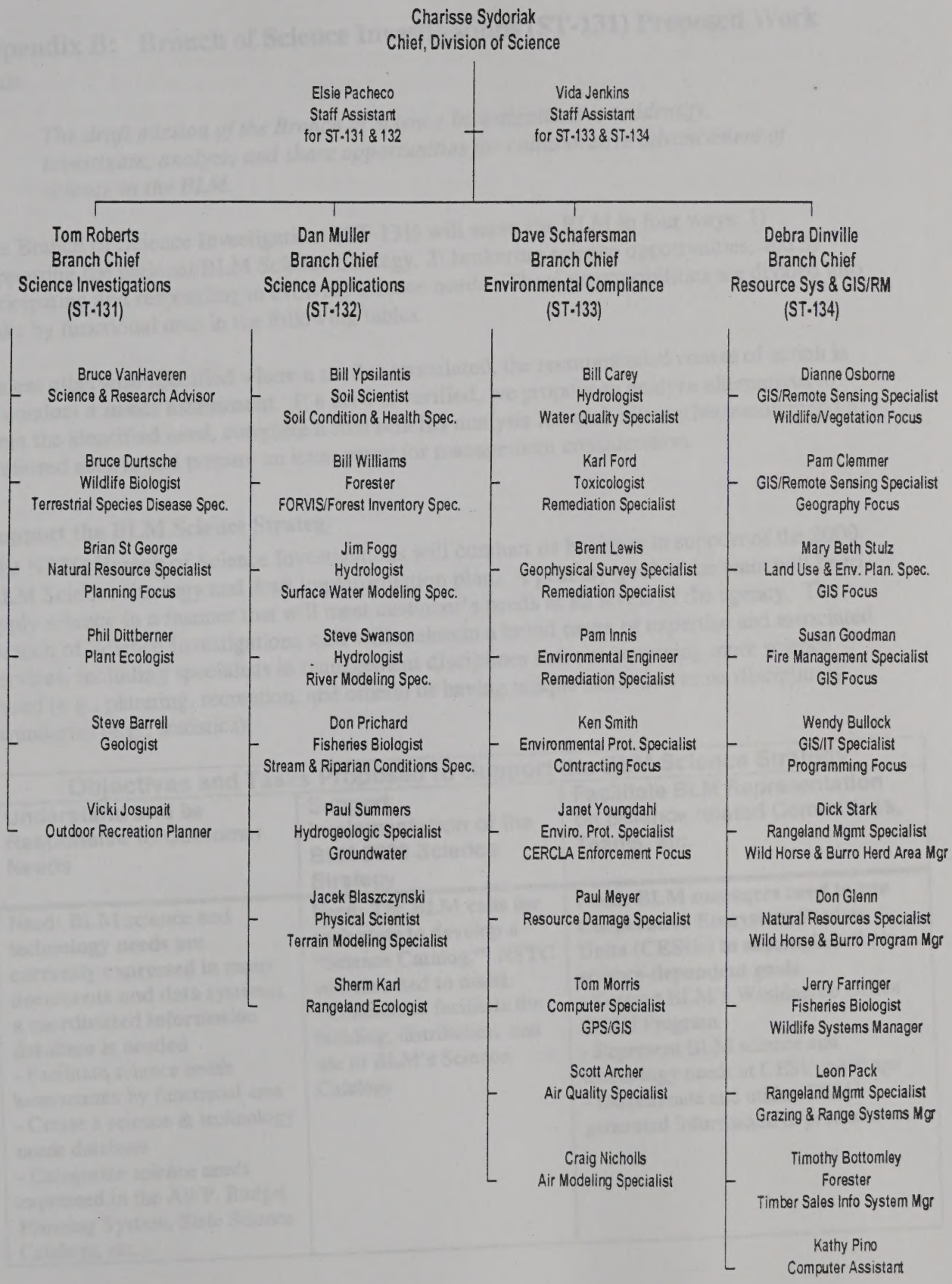
Appendix A: Division of Science Organization and Staff Functions

The NSTC Division of Science is functionally subdivided into four branches:

> "The main ingredient of stardom is the rest of the team."
> *John Wooden*

- Science Investigations (ST-131)
- Science Applications (ST-132)
- Environmental Compliance (ST-133)
- Resource Systems & Remote Sensing/GIS Applications (ST-134)

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Forester
Timber Sales Info System Mgr
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Appendix B: Branch of Science Investigations (ST-131) Proposed Work Plan

The draft mission of the Branch of Science Investigations is to identify, investigate, analyze, and share opportunities for collaborative advancement of science in the BLM.

The Branch of Science Investigations (ST-131) will serve the BLM in four ways: 1) supporting the national BLM Science Strategy, 2) brokering science opportunities, and 3) anticipating and responding to evolving science needs. These responsibilities are divided into tasks by functional area in the following tables.

Unless otherwise specified where a need is articulated, the recommended course of action is to conduct a **needs assessment**. If a need is verified, we propose to analyze alternatives to meet the identified need, complete a cost benefits analysis for each alternative, recommend a preferred action, and prepare an issue paper for management consideration.

Support the BLM Science Strategy

The NSTC Branch of Science Investigations will conduct its business in support of the 2000 BLM Science Strategy and draft implementation plan. A primary goal of the team will be to apply science in a manner that will meet customer's needs at all levels of the agency. The Branch of Science Investigations staff will maintain a broad range of expertise and associated services, including specialists in management disciplines that are becoming more science based (e.g., planning, recreation, and others) or having unique skills that cross disciplinary boundaries (e.g., statistics).

Objectives and Tasks Proposed to Support the BLM Science Strategy		
Understand and be Responsive to Customer Needs	**Support Implementation of the BLM 2000 Science Strategy**	**Facilitate BLM Representation on Science related Committees, Teams, etc.**
Need: BLM science and technology needs are currently expressed in many documents and data systems; a coordinated information database is needed - Facilitate science needs assessments by functional area - Create a science & technology needs database - Categorize science needs expressed in the AWP, Budget Planning System, State Science Catalogs, etc.).	**Need: The BLM calls for each state to develop a "Science Catalog." NSTC was directed to assist.** - Continue to facilitate the building, distribution, and use of BLM's Science Catalogs	**Need: BLM managers need to use Cooperative Ecosystem Studies Units (CESUs) to accomplish their science-dependent goals** - Support BLM's Washington Office CESU Program - Represent BLM science and technology needs at CESU meetings - Disseminate and utilize CESU generated information & products

Need: BLM science need may not be expressed adequately in current documents and systems, nor are the needs understood at all levels - Analyze contents of the needs assessment database in block 1 - Verify conclusions through interviews, questionnaires, and more - Prepare communications strategy and get NSTC Director approval - Distribute results & get feedback	**Need: To integrate and coordinate proposed science activities within the Bureau as prescribed by the BLM Directorate** - Review the PWP and AWP at every opportunity and explore options to help - Other actions depend on contents of the Science Strategy Implementation Plan which has not been released yet	**Need: BLM representation on intra- and interagency taskforces, panels, forums, and the like is important** - Continue NSTC support of the Sustainable Rangelands Roundtable, - Technology - Continue NSTC collaboration with USFS science and technology Development Centers (San Dimas, & Missoula) - Continue NSTC collaboration with the USGS - Continue NSTC collaboration with the NRCS Plant Material Centers, **Need: BLM representation is sometimes requested by lands-based NGO workgroups** - Continue to work on the Colorado Outdoor Recreation Resource Project
Need: BLM's science and technology needs/trends need to be monitored and reported - Annually update the science and technology needs database using the AWP, BPS, & every conceivable source of needs info. - Develop an annual report if there is interest	**Need: To maintain professional resource management skills at NSTC and Bureauwide** - Continue to facilitate, participate, and provide training for resource management professionals - Assess NSTC personnel training needs - Support NSTC personnel training needs.	**Need: To be more effective, NSTC needs to set the agenda and host focus group interactions to explore and resolve BLM issues on science related topics** -Initiate needs assessment for a "Science Frontiers" conference.

Broker Science Opportunities

The BLM is a multiple use agency without a clear research mandate. Like every other federal resource steward, however, the BLM wants to make resource management decisions based on sound, defensible, and credible scientific information. The BLM has not had, until now, a full-time work unit working to match Bureauwide science needs with potential providers regardless of affiliation. To accomplish this, ST-131 proposes the following tasks as a starting point. However, a framework and process will need to be developed in most cases.

Tasks Proposed to Broker Science Opportunities		
Broker	**Coordinate**	**Outreach**
Need: Science and technology evolve quickly but advances are slow to spread - Leverage NSTC skills & experience by creating a publications & products database and library if space can be found - Create & maintain networks	**Need: To be supportive and effective we need to constantly work on our relationships with Washington Office staff**	**Need: Many potential BLM customers are unaware of the services ST-130 provides** - Advertise the capabilities of the NSTC, the Division of Science, and the Branch of Science Investigations. - Visit State & field offices regularly
Need: To pair customer science needs with internal and external science & technology providers - Develop, maintain, and distribute a web-based database of internal and external science providers - Develop templates for all types of partnering and contracting instruments - Provide current lists of prospective partners to managers at all organizational levels in the BLM	**Need: Many BLM resource professionals work in relative isolation so they are unaware of others work and findings in science topics of interest** Communicate science-based findings applicable to BLM resource management issues: - Maintain and contribute to Resource Notes - Sponsor appropriate conferences and workshops - Utilize video conferencing capabilities to broadcast throughout the Bureau.	**Need: Potential BLM science and technology partners are often unaware of opportunities to collaborate** - Establish liaison, info sharing and/or work agreements with the USGS, USFS Research Stations, USFS Technology & Development Centers, and NRCS Plant Material Centers, if mutually beneficial. - Find other potential science provider opportunities
Need: Environmental service contracts are often difficult to develop and oversight of these contracts by non-technical BLM personnel is risky **Provide national** - Determine customer need for environmental contract support services - Complete a cost benefit & workload analysis - Develop a proposal, if justified	**Need: Teamwork opportunities between professionals at NSTC are not taken advantage of enough** - Facilitate (host) weekly brown bag luncheon presentations by ALL Division specialists	**Need: To be better informed and effective, we need to maintain working relationships with non-federal groups and/or organizations focusing on science-based issues**
Need: To find money to support customers needs - Identify sources of money and track in a database - Interview persons that are successful at getting external funds - Then develop procedures to leverage monies - Communicate findings to customers - Facilitate applications for $.	**Need: To insure defensible scientific results and recommendations** - Establish an internal & external peer review process for science-based products originating or sponsored by the NSTC ST-130 - Determine scope of need for statistical services at NSTC and Bureauwide - If need is validated, determine best way to fill the need.	

Anticipate and Respond to Evolving BLM Science Needs

Strategically, the Branch of Science Investigations is in the unique position of serving as a focal point to interpret and analyze the past, present, and future conditions. With such information they should be able to facilitate the development of new perspectives on old issues and to anticipate future science needs in the Bureau. The overarching need is to be in the position to address changing resource management conditions and questions.

Objectives & Tasks Proposed to Anticipate and Respond to Future Science Needs		
Learn from the Past	*Monitor the Present*	*Forecast, Adapt, & Respond*
Need: Support the BLM Legacy program	**Need: To anticipate needs ST-130 needs to monitor BLM science needs and trends**	**Need: The BLM needs to incorporate science in its strategic thinking, planning, and analysis processes**
Need: The state-of-knowledge by resource area is poorly known because the knowledge base expands rapidly - Continue to conduct literature reviews for subjects of interest - Establish & maintain a subject-matter experts database and consult with experts as needed	**Need: The BLM needs to have the capability of looking at resource management issues at multiple scales** - Continue to support current prototypical projects that can be applied on a broad scale basis; e.g., the Colorado Plateau resource assessment project & the Great Plains Analysis project	**Need: BLM lacks resource information at all scales, particularly at the regional and national scales** - Expand the Colorado Plateau regional assessment project to determine if the information synthesis process we developed is applicable in other ecoregions - Develop and test a process to analyze ecoregion information for use in cumulative impacts analyses and development of mitigation options
Need: The Plant Information Network (PIN) database is out-of-date. - Upgrade the database by adding new information - Add floral information from states that are not on the PIN - Create a users' guide	**Need: We duplicate work because we are unaware that the work has been done** - Precisely understand customer needs before doing work - Investigate who is doing what in the topic of interest during the project scoping process - Capitalize on other's work first then fill information gaps pertinent to customer needs	**Need: To support research that benefits customers** **Need: To support creative and opportunistic thinking** - Formalize regular branch & division brainstorming sessions

Appendix C: Branch of Science Applications (ST-132) Proposed Work Plan

The draft mission of the Branch of Science Applications is to adopt, develop, and use scientific concepts and methods to address resource management concerns..

The Branch of Science Applications (ST-132) has historically been responsible for serving the BLM by providing the following: 1) scarce skills to field offices in the form of consultation and technical assistance, 2) scientists working with other Federal agencies for integrated development of methods and applications, and 3) senior expertise to the BLM Washington Office to assist on developing technical guidance and support task groups.

The overall function of ST-132 is similar to a research extension office associated with western land grant universities. The staff provides assistance to facilitate development and transfer of applied science to aid the BLM in meeting its resource management mission. In particular, the functions of this staff support the Bureau in its GPRA goal of maintaining healthy ecosystems. The current ST-132 organization and staff is capable of meeting current demands by resource managers.

In the tables below, the "Current Capabilities" column represents current priority work for which there is or has been a BLM customer in the past five years. Branch specialists are responsible for services listed in this column. The "Perceived Unmet needs" column describes science needs that have been inspired by customer (e.g., WO, user groups, more than one State Office) demand or suggestions. Unless otherwise specified where a need is articulated, the recommended course of action is to conduct a **needs assessment**. If a need is verified, we propose to analyze alternatives to meet the identified need, complete a cost benefits analysis for each alternative, recommend a preferred action, and prepare an issue paper for management consideration.

Provide Scare Skills

Scarce resource support skills are effectively administered from centralized locations, such as the NSTC. Scarce skill specialists at NSTC provide many services, including consulting, training, scientific information transfer, public education, and tools development.

Tasks to Facilitate Provision of Scare Skills	
Current Capabilities	**Perceived Unmet Needs**
Aquatic Work - Instream flow assessments - Hydrologic regime analyses - Streambank assessments & restoration assistance - Aquatic T&E fisheries assessments	***Need: Non-point Source Pollution Assessments*** To protect aquatic resources and ecosystems, the BLM needs scientifically defensible geochemical information on non-point sources of pollution.
Riparian Work - Riparian ecosystem condition assessments	

Upland Work - Soil data analyses - Upland ecosystem condition assessments	
Ground Water Systems Work - Deep ground water analyses - Surface water & ground water interactions - Well site investigations	

Coordinate with External Partners

NSTC Division of Science staff, in coordination with WO program staffs, periodically represents BLM on interagency workgroups. Resulting products are non-binding until implementation is directed by the appropriate national program leads.

Tasks to Coordinate with External Partners	
Current Capabilities	**Perceived Unmet Needs**
Riparian Work - Riparian area assessment and monitoring - Restoration of riparian areas	
Upland Work - Erosion modeling - Forest vegetation modeling-assessment - Soil-landscape modeling - Soil crust assessment	**Ephemeral Drainage Work** **Need:** Development of assessment protocols, similar to Proper Functioning Condition initiatives and accomplishments, to determine condition and management prescriptions in ephemeral drainages. **Recommendation:** Prepare draft protocol process;. Address team membership, development schedule, and development costs

Provide Programmatic Technical Guidance

When requested by the BLM Washington Office, NSTC provides senior-level expertise pertinent to development and implementation of BLM natural resource management information bulletins, instructions, guidelines, and databases. We are most frequently assigned responsibility for development of technical guides and serving as subject-matter experts on national and interagency teams. Sometimes we are consulted when Bureau natural resource policies are being developed.

Tasks to Support Programmatic Technical Guidance		
Current Capabilities	**Perceived Unmet Needs**	**Propose to Discontinue**
Aquatic Work - Water use guidance	**Need: Provide Water Rights Expertise** To establish and protect BLM water resources and related values, the BLM needs to have integrated water rights expertise to: oversee data collection and analyses, recommend litigation strategies, provide training to managers, and develop institutional mechanisms for protecting public land water sources.	

Riparian Work - Riparian area mgt guidance		
Upland Work - Forest inventory protocols - Rangeland vegetation sampling protocols - Ecological site inventory guidance	**Forest Landscape Assessment Work** **Need:** Facilitate development of protocols for landscape-level assessments and management. Recommendation: Assess current methods and write recommendations for WO. **Regional Landslide Analyses** **Need:** BLM does not have a national or regional assessment of these hazards, as evidenced by a recent National Academy of Science workshop **Recommendation:** Create proposal to facilitate development of protocols for inventorying and dealing with these hazards.	**Forest Vegetation Information System (FORVIS)** **Need:** As FORVIS becomes fully implemented, the user representative function will require a more significant amount of time. Should NSTC continue to perform this work? If so, how?

Appendix D: Branch of Environmental Compliance (ST-133) Proposed Work Plan

The draft mission of the Branch Environmental Compliance assists BLM offices with environmental compliance and the cleanup and restoration of contaminated sites.

The Branch of Environmental Compliance (ST-133) is responsible for providing environmental science, engineering, and regulatory expertise in support of the BLM's efforts to evaluate, cleanup and restore contaminated sites, implement CERCLA cost recovery and enforcement actions, protect air and water quality, and comply with environmental laws and regulations associated with these activities. These functional areas have been historically identified by the BLM as needing centralized support.

In the tables below, the "Current Capabilities" column represents current priority work for which there is or has been a BLM customer in the past five years. Branch specialists are responsible for services listed in this column. The "Perceived Unmet Needs" column describes science needs that have been inspired by customer (e.g., WO, user groups, more than one State Office) demand or suggestions. Unless otherwise specified where a need is articulated, the recommended course of action is to conduct a **needs assessment**. If a need is verified, we propose to analyze alternatives to meet the identified need, complete a cost benefits analysis for each alternative, recommend a preferred action, and prepare an issue paper for management consideration.

Evaluate, Cleanup and Restore Contaminated Sites

As a designated lead agency and a trustee for natural resources on public lands, BLM must evaluate sites with suspected or known contamination, and cleanup those sites that pose a risk to human health and the environment and restore damaged natural resources. In addition, the BLM must complete these activities in accordance with the environmental laws and regulations that govern these actions. The BLM has assigned the responsibility to acquire and maintain the centralized resources necessary to assist BLM offices in their efforts to accomplish these tasks to the Branch of Environmental Compliance.

Tasks to Support Evaluation, Cleanup and Restoration of Contaminated Sites	
Current Capabilities	**Perceived Unmet Needs**
Evaluation - Preliminary Assessments/Site Inspections (PA/SI) - RCRA Facility Assessments/Corrective Measures Studies (RFA/CMS) - Environmental Site Assessments (ESA for land exchanges) - Environmental Risk Assessments - Geophysical Investigations - Site Mapping (GIS/GPS)	

- Multi-media Sampling and Analysis - Scientific and Technical Support (Hydrology, Hydrogeology, Toxicology, Water Chemistry)	
Cleanup - Engineering Evaluation/Cost Analyses (EE/CA) - Engineering Design and Design Review of Removal, Remedial and Corrective Measures - Construction Oversight of Cleanup Actions - Demonstration of New Cleanup Technologies	**Technical and Regulatory Support for Central Hazmat Funded Projects** **Need:** Ensure adequate technical and regulatory expertise support for CHF projects.
Restoration - Assessment of Natural Resource Damages - NRDAR Case Support - Planning, Design and Implementation of Restoration Actions	

Implement CERCLA Cost Recovery and Enforcement Actions

The policy of the BLM is that polluters should pay for the contamination caused by their activities on public lands. The Branch of Environmental Compliance, under the direction of the BLM, has acquired the resources necessary to assist BLM offices and the Department with their efforts to recover costs resulting from the evaluation, cleanup and restoration of contaminated sites from parties responsible for the contamination.

Tasks to Support CERCLA Cost Recovery and Enforcement Actions	
Currently Capabilities	**Perceived Unmet Needs**
Cost Recovery - Conduct PRP Searches - Determine PRP Liability and Financial Viability - Prepare Cost Recovery Plans & Memoranda - Establish Administrative Records - Support Negotiations with PRPs	***Central Hazmat Funded (CHF) Projects*** **Need:** Ensure adequate cost recovery support for CHF projects.
Enforcement - Prepare CERCLA Information Requests (104e), General Notice Letters, Dexision Memorandums - Provide Litigation Support to Department Solicitors	**Environmental Mediation** **Need:** Ensure adequate alternative dispute resolution measures in dealing with PRPs.

Provide National Program Support

The Branch of Environmental Compliance provides programmatic support for the above areas in the form of assistance with guidance and policy development, training, technology transfer, contracting, and BLM representation on local, regional and national professional organizations.

Tasks to Support National Environmental Compliance Programs	
Currently Capabilities	**Perceived Unmet Needs**
Programmatic Support - Policy and Guidance Assistance - Technology Transfer - Contracting - Training - BLM Representation - Health and Safety for Hazardous Waste Operations	

Provide Air and Water Quality Support

BLM is required to comply with the provisions of the Clean Water Act and Clean Air Act and supporting regulations. The Branch of Environmental Compliance provides assistance to BLM field offices in matters directly related to compliance with these laws and regulations.

Tasks to Support Air & Water Quality Protection	
Current Capabilities	**Perceived Unmet Needs**
Air Quality -Sampling, analysis and monitoring support -Data interpretation and analysis -Modeling	**Climate Support** **Need:** Access to, and application of, climatic data is essential to the management of the public lands. The availability and use of climatic data is limited within the BLM
Water Quality -Clean Water Act compliance advice -Sampling, analysis and monitoring support -Data interpretation and analysis -Special Studies (Tracer Injection)	**Non-point Source Pollution/TMDL** **Need:** Non-point source pollution and TMDL have become major issues within the BLM regarding compliance with the CWA. There has not been a consistent approach to these issues

Appendix E: Branch of Resource Systems & Remote Sensing/GIS Applications (ST-134) Proposed Work Plan

The draft mission of the Branch of Resource Systems & Remote Sensing/GIS Applications is to provide leadership and assistance in the development and use of advanced technological applications for resource management.

The Branch of Resource Systems and Remote Sensing/GIS Applications (ST-134) currently views itself as responsible for serving the BLM in four ways: 1) support national natural resource programs that are database driven, 2) facilitate use of rapidly evolving technology by resource managers, and 3) facilitate transference of technical skills Bureau-wide.

In the tables below, the "Current Capabilities" column represents current priority work for which there is or has been a BLM customer in the past five years. Branch specialists are responsible for services listed in this column. The "Perceived Unmet needs" column describes science needs that have been inspired by customer (e.g., WO, user groups, more than one State Office) demand or suggestions. Unless otherwise specified where a need is articulated, the recommended course of action is to conduct a **needs assessment**. If a need is verified, we propose to analyze alternatives to meet the identified need, complete a cost benefits analysis for each alternative, recommend a preferred action, and prepare an issue paper for management consideration.

Support National Natural Resource Programs

The Branch of Resource Systems and Remote Sensing/GIS Applications works with National Program Offices to provide essential natural resource data identified in the BLM *Strategic Plan*. One of the primary responsibilities for five of the ST-134 specialists is to facilitate the development and use of national natural resource databases and/or systems through the Internet and enable national and field level program offices to create and access spatially referenced databases that meet national data standards.

Tasks Proposed to Support National Programs		
Current Capabilities	**Perceived Unmet Needs**	**Propose to Discontinue**
Serve a User Rep Role for the Wild Horse and Burro Program System (WHBSYS) - Facilitate creation of a single comprehensive WHBP database management system - Administer existing Horse and Burro (HB) disposal system for users of data until FY'05. - Fix printing problems to the current system through a web design	**Needs:** The BLM WHBP database mgmt system is inadequate to met the needs of the Bureau. **Recommendations:** - Analyze current business processes through the Business Process Re-engineering Lab - Collect user requirements for the new system based on collection, storing and reporting data for a combined system -Re-engineer the current WH&B business process to make budget and accomplishment reporting easier and to reduce the costs to the public .	Supporting unlinked WHB Program databases

	-Provide links and ties to associated systems	
Serve a User Rep Role for the Rangeland Administration System (RAS) & Rangeland Improvement Project System (RIPS) - Facilitate compliance with Laws and OMB guidance - Identify modifications needed to improve the system (through user teams) - Provide training, program assistance and user support - Produce RIPS reports for national use - Participate in the Configuration Management Board (CMB) to address modifications and enhancements to the systems	**Need**: The BLM RIPS database mgmt system is inadequate to met the needs of the Bureau **Recommendations:** - Re-engineer and rehost the RIPS system from DOS based PC's to operate on the intranet - Analyze use of current system for input into new design - Collect user requirements - Participate on a RIPS CMB - Reduce the costs to the public of business conducted by the rangeland program	
Serve User Rep Role for the Timber Sales Information System (TSIS) - Restart the program (has been inactive for 2 years) by operating/ and maintaining the existing system until the results are in for work recommended for this program. - Facilitate compliance with mandates, policies and OMB guidance related to timber information management; e.g., produce TSIS reports for national use -Prepare annual statistics for use in Public Land Statistics (PLS) report	**Need:** is the BLM TSIS database mgmt system adequate to met the needs of the Bureau? **Recommendations:** - Facilitate a system needs assessment through use teams and document findings. - - Solicit and compile user requirements for the new system. Make recommendations for reengineering or replacing the system, as appropriate - Determine if other forestry databases can meet BLM needs and manage the change if a suitable system is available - Facilitate development of a business case for an integrated forest system if customers wants such a system - Determine if and how the cost to the public of business conducted by the Forestry Program can be reduced or stabilized. Document current operating and maintenance costs. -Provide links and ties to associated systems	
Serve User Rep Role for Special Status Species Tracking (SSST) and the Species Tracking System (STS) - Facilitating compliance with mandates, policies, and OMB guidance pertaining to species tracking - Operating and maintaining the existing system	**Need:** The BLM species tracking database mgmt system is inadequate to meet the needs of the Bureau. **Recommendation:** Perform an inventory of other species tracking systems and their functionality to determine how to best meet BLM needs (prepare a report and recommendations)	SSST and STS if another system can replace them

- Providing technical support for to the users of the system		
Prepare annual statistics for use in Public Land Statistics (PLS) report	**Need:** Creation of PLS reports is time-consuming and difficult. Are there some reports that are not needed? **Recommendation:** Assess the value of each report we prepare; recommend improvements, if appropriate for reports that have value.	
Support the National Fire Plan and BLM fire management needs/policy - Serve on national committees - Developing useful GIS tools for managers and the public - Compile annually fire history data into GIS layer for Federal wildland fires - Compile annually in a GIS layer Federal completed fuels projects - Coordinate fire training and red cards for BLM Federal Center staff - Provide wildland fire and GIS expertise to Geospatial Multi-Agency Coordination Group (GeoMAC) and to BLM Fire Management Specialist.	**Need:** The National Fire Plan (NFP) is a major interagency agreement about how to manage wildland fires on federal lands. We are often called upon to support Plan related actions. Our continuing responsibilities are not documented. **Recommendation:** Determine the best role and function for the NSTC in support the BLM fire program. Clarify in writing.	Creating GIS digital and wall maps for dispatch and coordination centers
Participate on the National Wildfire Coordinating Group (NWCG) Geospatial Task Group	**Need:** Interagency geospatial standards for wildland fire applications are needed to protect lives, property and natural resources. **Recommendations** - Implement use of policy of the FAM ITIB Project Proposal Guide (need to interpret)	
Assist BLM National Program Leaders (WO) Responsible for Generation and Maintenance of Electronic Data - Continue to serve on BLM **geospatial technical service teams**: 1) the Enterprise GIS Project; 2) the ePlanning Project, - Continue to provide **geospatial consultant services** on the following: 1) BLM Data Management Plan - continue to **represent the BLM on interagency teams**: 1) represent BLM on the oversight team for the Southwest Regional Gap Project; 2) NW Regional Gap	**Need:** The WO needs technical experts to consult with and to perform tasks. Misunderstandings occur when work agreements are not documented, particularly if they involve IT operations. **Recommendations:** Clarify our responsibilities by scoping current assignments and documenting in "Service Level Agreements (SLAs)." - Ask WO to clarify our role in data mgmt. How are we to contribute to the BLM Data Mgmt Plan? What are our responsibilities relative to compliance with Federal Geographic Data Committee federal data geospatial standards? How do they apply to: - National trails data standards	

Project; 3) USGS/BLM Invasives Mapping; a4) USGS/BLM DOQ production, and 5) the Civil Applications Committee. - serve as **Project Inspector** for the *Landscape Ecology: Modeling and Analysis Center*	- Wilderness data standards - Land Use Planning data standards - The spatial component in these databases Initiate a review process for SWREGAP and Land Use History of North America (LUHNA) proposals	
Maintain the Bureau's satellite imagery archive. - Produce and disseminate imagery to the field users upon request	**Need:** NSTC has maintained all the imagery data obtained for the Bureau, a corporate asset and expense. **Recommendation:** Assess the need to develop an online satellite imagery archive and retrieval system.	

Facilitate Use of Technology by Resource Managers

ST-134 specialists examine dynamic technological developments applicable to the Bureau's business systems. The Internet has had a dramatic impact on day-to-day business and information transactions. It will be increasingly used as a means to provide access to government information, gain public involvement and improve government credibility. BLM needs to take its data and spatial analysis capabilities online, providing public interaction with BLM in a positive way. The Federal government is and will continue to be more dependent on e-business applications and online databases, information sharing and warehousing.

In addition to meeting the challenges associate with the areas of responsibility identified above, the staff of ST-134 are responsible for advising, counseling, and serving NSTC technology users.

Tasks Proposed to Facilitate Use of Technology by Resource Managers	
Currently Capabilities	**Perceived Unmet Needs**
Provide multi-programmatic GIS and remote sensing project specific support to NSTC specialists and other BLM resource managers -Complete the evaluation and transition to ArcSDE 8.1 -Establish internet access to NSTC's ArcIMS web sites - Bring the production ArcIMS server on-line and into full use - Develop and facilitate Joint Fire Science Projects	**Need:** how can the ST-134 staff best serve the technology support needs of today's BLM managers? **Recommendations:** - Assess and document the need for GIS and Remote Sensing tools that will support BLM national mandates and initiatives - Assess and document the need for GIS and remote sensing services, and other technology dependent tools that BLM personnel need at Field and State Offices - Assess the need and look for opportunities to develop partnerships with other agencies in regional land use and land cover change detection efforts AND other resource management applications identified by customers - Assess NSTC programmatic needs and workforce capacity relative to technology support services; then figure out how these needs can be most effectively met
Develop and maintain the following web sites: 1) Priority Sub basin Identification Project (PSIP); 2)	**Need:** it is not clear whether the websites we have built and maintain are meeting BLM needs. In addition, are there other interactive or static spatial display needs that are not being addressed. - Assess the need for NSTC maintained websites.

Vegetation Environmental Impact Statement (VEGEIS); 3) Western Regional Corridor Natural Assessment Prototype; 4) BLM Budget Site; & 5) FERC Re-license Site.	- Assess the need for a National GIS web site and its contents; and provide development services and user support, as appropriate - Assess the need and best means of supporting NSTC, WO and other BLM staff in the use of Arc Spatial Data Engine (ArcSDE) - Assess the need to create Arc Internet Mapping Service (ArcIMS) prototypes for wildland fire.
Facilitate and test new technology applications. - Support OHV impacts studies on Special Status Species (e.g., Sand Hills blue butterfly) -Map T&E species habitat -Inventory black-tailed prairie dog colonies - Support of wildlife habitat planning efforts (e.g., Carson City, Lewistown, Montrose) using high resolution imagery.	**Need:** What are the advanced technology applications needs of the Bureau at present and what are they likely to be in the next 5-years? **Recommendation:** Upon completion of a needs assessment, develop a strategy, tools, and processes to fill BLM needs. - Develop an online data repository (corporate data) for use at the NSTC and in the field, to efficiently complete requests for data.

Facilitate Advanced Technology Skills Development Bureauwide

For the NSTC Resource Systems and Remote Sensing/GIS Applications Branch to be successful, sufficient knowledge transfer needs to occur. Applying technology transfer is a goal of the Branch to achieve organization effectiveness in the use of existing and new tools.

Tasks Proposed to Facilitate Advanced Technology Skills Development Bureauwide	
Current Capabilities	***Perceived Unmet Needs***
Provide Spatial Technology Tools Training - Provide technical advice and assistance in the customers' use and application of GIS and remote sensing tools - Continue to train BLM staff at the National Training Center, NSTC, and upon request in other locations - Develop, enhance, maintain, document, promote, and provide user support for NSTC developed GIS applications	**Need:** To be most effective, BLM managers and specialists need to have advance technology applications skills. What skills do they need our help to attain over the next 5 years? **Recommendations:** - Assess the value and need for systematic testing of emerging technical tools that are not geospatial. If there is a need, how critical is the need for each category of tool?